

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

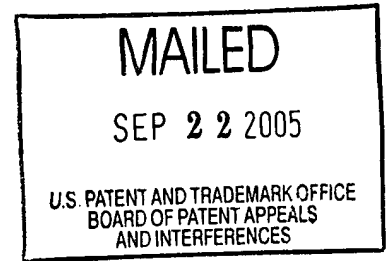
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROBERT A. SHEPHERD, JR.,
and JAMES CAUGHRAN

Appeal No. 2005-2360
Application 10/006,100

ON BRIEF



Before WARREN, KRATZ and TIMM, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

Decision on Appeal and Opinion

We have carefully considered the record in this appeal under 35 U.S.C. § 134, including the opposing views of the examiner, in the answer, and appellants, in the brief, and based on our review, find that we cannot sustain the grounds of rejections advanced on appeal: appealed claims 1 through 17 under 35 U.S.C. § 103(a) as being unpatentable over Moslehi et al. (Moslehi) in view of Notman (action mailed February 17, 2004, pages 2-5; answer, pages 3-6); and appealed claims 18 through 23 under 35 U.S.C. § 103(a) as being unpatentable over Moslehi in view of Rudolph et al. (Rudolph) (action mailed February 17, 2004, pages 5-8; answer, pages 6-7)^{1,2}

¹ Appealed claims 18 through 23 are all of the claims in the application. See the appendix to the brief filed July 21, 2004. The appealed claims have been twice rejected.

We refer to the answer and to the brief for a complete exposition of the respective positions advanced by the examiner and appellants.

It is well settled that in order to establish a *prima facie* case of obviousness under § 103(a), the examiner must show that some objective teaching, suggestion or motivation in the applied prior art taken as a whole and/or knowledge generally available to one of ordinary skill in this art would have led that person to the claimed invention as a whole, including each and every limitation of the claims arranged as required by the claims, without recourse to the teachings in appellants' disclosure. *See generally, In re Rouffet*, 149 F.3d 1350, 1358, 47 USPQ2d 1453, 1458 (Fed. Cir. 1998); *Pro-Mold and Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1629-30 (Fed. Cir. 1996); *In re Fritch*, 972 F.2d 1260, 1265-66, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992); *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); *In re Laskowski*, 871 F.2d 115, 10 USPQ2d 1397 (Fed. Cir. 1989); *In re Fine*, 837 F.2d 1071, 1074-76, 5 USPQ2d 1596, 1598-1600 (Fed. Cir. 1988).

Considering first the ground of rejection over the combined teachings of Moslehi and Notman, we find that representative independent claim 1 encompasses the apparatus for managing plasma in a wafer processing operation illustrated in specification **Fig. 3**. The examiner finds that the holes in baffle plates **130,132,134** separating spaces **124,162,154,152** of the reactor illustrated in Moslehi **FIG. 3** "are aligned thus defining a linear path for fluids," and thus "does not teach the plurality of holes are misaligned defining a nonlinear path for fluids" as required by claim 1 (action mailed February 17, 2004, pages 3 and 4). The examiner further finds that Notman discloses a "reactor (Figure 5) including baffles [*sic*, baffle] plates (16b', 16b", 49') each with plurality of holes (52, 36 for 16b'; 53, 36 for 16b'; 54, 36 for 49') [which] are misaligned defining a nonlinear path for fluid flow" (*id.*, page 4). On this basis, the examiner concludes that it would have obvious to one of ordinary skill in the art "to shift (move) one or more of Moslehi's baffle plates horizontally such that each of the plurality of holes are misaligned defining a nonlinear path for fluid flow as taught by [Notman]" in order "to provide for a nonlinear flow through the reactor" (*id.*, pages 4-5).

² The examiner states that the grounds of rejection are stated in the action mailed February 17, 2004.

On this record, we fail to find in the combined teachings of Moslehi and Notman substantial evidence in support of the examiner's position. Notman would have disclosed to one of ordinary skill in this art with respect to Notman **FIG. 1**, that pipes **36** are "catalyst emptying" which "are not closed at their upper ends because the pressure drop through them when filled with catalyst is greater than the pressure drop through grids **16A**, **16B**, **16C**" (e.g., col. 7, ll. 22-31). We find no disclosure in Notman with respect to pipes **36** in Notman **FIG. 5**, and there is no disclosure in the reference that gas passes through these pipes. Notman would have further disclosed that "by-pass" pipes **53,54,56** are used to separate the flow of gas between different areas of the Notman **FIG. 5** reactor, and indeed, pipes **52** and **54**, which pass through a grid **16** are not flush with the grid, and pipes **53** and **56** do not contact a grid **16**.

We find that the grids **16** in Notman **Figs. 1, 2, 3** and **5** do contain holes through which gas flows as illustrated, and are the closest structures in Notman to baffle plates **130,132,134** of Moslehi. However, we find no teaching or inference that one of ordinary skill in the art would have found in Notman which would have led that person to arrange baffle plates **130,132,134** of Moslehi in such manner as to arrive at misaligned holes in said plates which result in a nonlinear path for fluids therebetween.³

Accordingly, we determine that the examiner has not established a *prima facie* case of obviousness of the apparatus for managing plasma in a wafer processing operation encompassed by appealed claims 1 through 17 within the meaning of 35 U.S.C. § 103(a), and thus, reverse this ground of rejection.

Turning to the ground of rejection over the combined teachings of Moslehi and Rudolph, we find that representative independent claim 18 encompasses the apparatus for managing plasma in a wafer processing operation illustrated in specification **Fig. 2C**. The examiner finds that hollow tube plasma inlet **122** of the reactor illustrated in Moslehi **Fig. 4** meets all of the limitations of the hollow tube in a housing of claim 18 except for several significant differences:

³ It is well settled that a reference stands for all of the specific teachings thereof as well as the inferences one of ordinary skill in this art would have reasonably been expected to draw therefrom, *see In re Fritch*, 972 F.2d 1260, 1264-65, 23 USPQ2d 1780, 1782-83 (Fed. Cir. 1992); *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968), presuming skill on the part of this person. *In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985).

the connection between each of the ends of the housing and the ends of the hollow tube, and “a plurality of orifices that define a plurality of fluid paths through the wall” of the hollow tube (action mailed February 17, 2004, pages 5-6 and 8). The examiner finds that “Rudolph teaches a similar gas dispersion plates (104, Figure 6) that are also staggered . . . [and] a hollow tube ([see Moslehi] 122, Figure 4; column 12; lines 46-68) conduit ([see Rudolph] 17, Figure 6) that is perforated” (*id.*, page 8).

On this basis, the examiner concludes that it would have obvious to one of ordinary skill in the art “to replace Moslehi’s plasma delivery conduit (122; Figure 4) with Rudolph’s perforated hollow tube ([see Moslehi] 122, Figure 4; column 12; lines 46-68) conduit ([see Rudolph] 17, Figure 6) such that Moslehi’s plasma delivery conduit extends to an output (180) of the housing (both sides, 165, Figure 4)” because the result of the proposed modification is that “Moslehi’s plasma delivery conduit extends to an output (180) of the housing (both sides; 165, Figure 4) is to provide for gas dispersion as taught by Rudolph (column 9, lines 53-65)” (*id.*, page 8).

On this record, we fail to find in the combined teachings of Moslehi and Rudolph substantial evidence in support of the examiner’s position. Moslehi would have disclosed to one of ordinary skill in this art that in the semiconductor process chamber illustrated in Moslehi **FIG. 4**, “process plasma **120** enters plasma fill space **124** via process plasma inlet **122**” (col. 9, ll. 44-46). Moslehi does not disclose any other purpose of plasma inlet **122**. Rudolph would have disclosed to this person that as illustrated in Rudolph **FIG. 6**, “inlet **16** preferably comprises a plurality of perforated inlet legs **17** and **19** that disperse the gas within the sealed duct structure **102** before entering the sealed baffle structure **108**” (col. 9, ll. 57-60). Rudolph **FIG. 6** is “a sectional view along lines **6-6** of **FIG. 5**” which is a “top view of the **FIG. 4** preheater” (col. 4, ll. 43-45). Rudolph **FIG. 4** provides a further perspective of perforated inlet leg **19** and Rudolph **FIG. 5** provides another perspective of inlet **16** and perforated inlet legs **17** and **19**. We find that Rudolph would have taught one of ordinary skill in this art that the perforated inlet legs are horizontally arranged in order to distribute gas from inlet **16** to sealed baffle structure **108**.

We find no structure in Moslehi **FIG. 4** corresponding to sealed baffle structure **108** of Rudolph **FIG. 6**. We fail to find in the combined teachings of Moslehi and Rudolph any

suggestion to one of ordinary skill in this art to remove perforated inlet leg **17** from the assembly of inlet **16** and perforated inlet legs **17** and **19**, change its position from horizontal to vertical and use it in place of hollow tube **122** in the reactor illustrated in Moslehi **FIG. 4** to distribute plasma **120** in plasma fill space **124**, and particularly when plasma fill space **124** has significant volume vis-à-vis the space occupied by inlet **16** and perforated inlet legs **17** and **19** illustrated in Rudolph **FIG. 6**. “The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification.” *Fritch*, 972 F.2d at 1266, 23 USPQ2d at 1784-85.

Accordingly, we determine that the examiner has not established a *prima facie* case of obviousness of the apparatus for managing plasma in a wafer processing operation encompassed by appealed claims 18 through 23 within the meaning of 35 U.S.C. § 103(a), and thus, reverse this ground of rejection.

The examiner’s decision is reversed.

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BOARD OF PATENT APPEALS AND INTERFERENCES

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Appeal No. 2005-2360
Application 10/006,100

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